# Temperature and strain sensing techniques using brillouin optical time domain reflectometry

Abstract :

Distributed strain sensing based on Brillouin Optical Time Domain Reflectometry (BOTDR) is seen as one of the most promising monitoring tools for assessing the performance of civil and geotechnical structures. Due to the distributed nature of fiber optic sensor, BOTDR not only useful to monitor the structures deformation in terms of global behavior, but also effectively detects anomalies in localized scale. Since the sensor has the ability to measure strain and temperature simultaneously, it is important that methods to separate the temperature effects are fully understood. Four known methods used to compensate temperature from BOTDR strain readings are briefly reviewed. Regardless of what method being used, this paper aims to clarify the importance of firstly calibrating the thermal characteristic of optical cables and determine the coefficient thermal expansion of the measurement host or structure. Example of BOTDR thermal measurement of an earth retaining structure is presented.